SEQUENCE LISTING

<110> Houghton, Raymond L.
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Persing, David H.

<120> METHODS, COMPOSITIONS AND KITS FOR THE DETECTION AND MONITORING OF BREAST CANCER

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65                  70                  75                  80
Val Leu Pro Leu Leu Pro Leu Leu Gln Gly Ser Gly Lys Ser Asn Val
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His Val His Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp
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Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr
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Ala Val Tyr Asn Glu Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr
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Leu Gly Ile His Glu Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys
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Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu
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Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu
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Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr His Val His Gly Glu
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Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg
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Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Arg Asp
            100                 105                 110

Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly Asn Ser
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Glu Val Val Lys Leu Val Leu Asp Arg Arg Cys Gln Leu Asn Val Leu
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Asp Asn Lys Lys Arg Thr Ala Leu Thr Lys Ala Val Gln Cys Gln Glu
145                 150                 155                 160

Asp Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile
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Pro Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Val Tyr Asn Glu
            180                 185                 190

Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu
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Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Ile His Glu
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Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu
225                 230                 235                 240

Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cys
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Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu Glu Gln Asn Val Asp
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<213> Homo sapien

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        35                  40                  45
His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
    50                  55                  60
Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
65                  70                  75                  80
Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
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Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
            100                 105                 110
Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
        115                 120                 125
Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
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Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
145                 150                 155                 160
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Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
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Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
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Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
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Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
225                 230                 235                 240
Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
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Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
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Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
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Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val
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His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
    50                  55                  60
Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
65                  70                  75                  80
Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
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Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
            100                 105                 110
Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
        115                 120                 125
Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
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Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
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Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
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Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
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Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
225                 230                 235                 240
Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
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Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
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Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
305                 310                 315                 320
Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
                325                 330                 335
Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val
            340                 345                 350
Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
        355                 360                 365
Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu
    370                 375                 380
Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys
385                 390                 395                 400
```

```
Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu
                405                 410                 415
Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn
            420                 425                 430
Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro
        435                 440                 445
Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu
    450                 455                 460
Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu
465                 470                 475                 480
Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp
                485                 490                 495
Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu
            500                 505                 510
Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys
        515                 520                 525
Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly
    530                 535                 540
Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser
545                 550                 555                 560
Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr
                565                 570                 575
His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln
            580                 585                 590
Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln
        595                 600                 605
Ile Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys
    610                 615                 620
Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile
625                 630                 635                 640
Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
                645                 650                 655

      <210> 10
      <211> 671
      <212> PRT
      <213> Homo sapien

      <400> 10
Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1               5                  10                  15
Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
            20                  25                  30
Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
        35                  40                  45
His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
    50                  55                  60
Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
65                  70                  75                  80
Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
                85                  90                  95
Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
            100                 105                 110
Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
```

```
        115                 120                 125
Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
    130                 135                 140
Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
145                 150                 155                 160
Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
                165                 170                 175
Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
            180                 185                 190
Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
        195                 200                 205
Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
    210                 215                 220
Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
225                 230                 235                 240
Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
                245                 250                 255
Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
            260                 265                 270
Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val
        275                 280                 285
Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
    290                 295                 300
Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
305                 310                 315                 320
Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
                325                 330                 335
Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val
            340                 345                 350
Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
        355                 360                 365
Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu
    370                 375                 380
Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys
385                 390                 395                 400
Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu
                405                 410                 415
Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn
            420                 425                 430
Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro
        435                 440                 445
Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu
    450                 455                 460
Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu
465                 470                 475                 480
Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp
                485                 490                 495
Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu
            500                 505                 510
Asn Gly Gln Pro Glu Lys Arg Ser Gln Glu Pro Glu Ile Asn Lys Asp
        515                 520                 525
Gly Asp Arg Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys Lys
    530                 535                 540
His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly Ala
```

```
545                 550                 555                 560
Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser Arg
                565                 570                 575
Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr His
            580                 585                 590
Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln Asn
        595                 600                 605
Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln Ile
    610                 615                 620
Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys Lys
625                 630                 635                 640
Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile Ala
                645                 650                 655
Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
            660                 665                 670
```

<210> 11
<211> 800
<212> DNA
<213> Homo sapien

<400> 11

```
atkagcttcc gcttctgaca acactagaga tccctcccct ccctcagggt atggccctcc      60
acttcatttt tggtacataa catctttata ggacaggggt aaaatcccaa tactaacagg     120
agaatgctta ggactctaac aggtttttga gaatgtgttg gtaagggcca ctcaatccaa     180
ttttttcttgg tcctccttgt ggtctaggag gacaggcaag ggtgcagatt ttcaagaatg     240
catcagtaag ggccactaaa tccgaccttc ctcgttcctc cttgtggtct gggaggaaaa     300
ctagtgtttc tgttgctgtg tcagtgagca caactattcc gatcagcagg gtccagggac     360
cactgcaggt tcttgggcag ggggagaaac aaaacaaacc aaaaccatgg gcrgttttgt     420
ctttcagatg ggaaacactc aggcatcaac aggctcacct ttgaaatgca tcctaagcca     480
atgggacaaa tttgacccac aaaccctgga aaaagaggtg gctcattttt tttgcactat     540
ggcttggccc caacattctc tctctgatgg ggaaaaatgg ccacctgagg gaagtacaga     600
ttacaatact atcctgcagc ttgacctttt ctgtaagagg gaaggcaaat ggagtgaaat     660
accttatgtc caagctttct tttcattgaa ggagaataca ctatgcaaag cttgaaattt     720
acatcccaca ggaggacctc tcagcttacc cccatatcct agcctcccta tagctcccct     780
tcctattagt gataagcctc                                                800
```

<210> 12
<211> 102
<212> PRT
<213> Homo sapien

<220>
<221> VARIANT
<222> (1)...(102)
<223> Xaa = Any Amino Acid

<400> 12

```
Met Gly Xaa Phe Val Phe Gln Met Gly Asn Thr Gln Ala Ser Thr Gly
 1               5                  10                  15
Ser Pro Leu Lys Cys Ile Leu Ser Gln Trp Asp Lys Phe Asp Pro Gln
            20                  25                  30
Thr Leu Glu Lys Glu Val Ala His Phe Phe Cys Thr Met Ala Trp Pro
        35                  40                  45
```

```
Gln His Ser Leu Ser Asp Gly Glu Lys Trp Pro Pro Glu Gly Ser Thr
    50                  55                  60
Asp Tyr Asn Thr Ile Leu Gln Leu Asp Leu Phe Cys Lys Arg Glu Gly
65                  70                  75                  80
Lys Trp Ser Glu Ile Pro Tyr Val Gln Ala Phe Phe Ser Leu Lys Glu
                85                  90                  95
Asn Thr Leu Cys Lys Ala
            100
```

<210> 13
<211> 1206
<212> DNA
<213> Homo sapien

<400> 13

```
ggcacgagga agttttgtgt actgaaaaag aaactgtcag aagcaaaaga aataaaatca      60
cagttagaga accaaaaagt taaatgggaa caagagctct gcagtgtgag gtttctcaca     120
ctcatgaaaa tgaaaattat ctcttacatg aaaattgcat gttgaaaaag gaaattgcca     180
tgctaaaact ggaaatagcc acactgaaac accaatacca ggaaaaggaa aataaatact     240
ttgaggacat taagatttta aaagaaaaga atgctgaact tcagatgacc ctaaaactga     300
aagaggaatc attaactaaa agggcatctc aatatagtgg gcagcttaaa gttctgatag     360
ctgagaacac aatgctcact tctaaattga aggaaaaaca agacaaagaa atactagagg     420
cagaaattga atcacaccat cctagactgg cttctgctgt acaagaccat gatcaaattg     480
tgacatcaag aaaaagtcaa gaacctgctt tccacattgc aggagatgct tgtttgcaaa     540
gaaaaatgaa tgttgatgtg agtagtacga tataataaca tgaggtgctc catcaaccac     600
tttctgaagc tcaaaggaaa tccaaaagcc taaaaattaa tctcaattat gccggagatg     660
ctctaagaga aaatacattg gtttcagaac atgcacaaag agaccaacgt gaaacacagt     720
gtcaaatgaa ggaagctgaa cacatgtatc aaaacgaaca agataatgtg aacaaacaca     780
ctgaacagca ggagtctcta gatcagaaat tatttcaact acaaagcaaa aatatgtggc     840
ttcaacagca attagttcat gcacataaga aagctgacaa caaaagcaag ataacaattg     900
atattcattt tcttgagagg aaaatgcaac atcatctcct aaaagagaaa aatgaggaga     960
tatttaatta caataaccat ttaaaaaacc gtatatatca atatgaaaaa gagaaagcag    1020
aaacagaagt tatataatag tataacactg ccaaggagcg gattatctca tcttcatcct    1080
gtaattccag tgtttgtcac gtggttgttg aataaatgaa taaagaatga gaaaaccaga    1140
agctctgata cataatcata atgataatta tttcaatgca caactacggg tggtgctgct    1200
cgtgcc                                                               1206
```

<210> 14
<211> 317
<212> PRT
<213> Homo sapien

<400> 14

```
Met Gly Thr Arg Ala Leu Gln Cys Glu Val Ser His Thr His Glu Asn
 1               5                  10                  15
Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys Glu Ile Ala
            20                  25                  30
Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr Gln Glu Lys
        35                  40                  45
Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu Lys Asn Ala
    50                  55                  60
Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu Thr Lys Arg
65                  70                  75                  80
Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala Glu Asn Thr
```

```
                85                  90                  95
Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu Ile Leu Glu
            100                 105                 110
Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala Val Gln Asp
        115                 120                 125
His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro Ala Phe His
    130                 135                 140
Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val Asp Val Ser
145                 150                 155                 160
Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu Ser Glu Ala
                165                 170                 175
Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr Ala Gly Asp
            180                 185                 190
Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln Arg Asp Gln
        195                 200                 205
Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met Tyr Gln Asn
    210                 215                 220
Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu Ser Leu Asp
225                 230                 235                 240
Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu Gln Gln Gln
                245                 250                 255
Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys Ile Thr Ile
            260                 265                 270
Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu Leu Lys Glu
        275                 280                 285
Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys Asn Arg Ile
    290                 295                 300
Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Val Ile
305                 310                 315
```

<210> 15
<211> 1665
<212> DNA
<213> Homo sapien

<400> 15

```
gcaaactttc aagcagagcc tcccgagaag ccatctgcct tcgagcctgc cattgaaatg      60
caaaagtctg ttccaaataa agccttggaa ttgaagaatg aacaaacatt gagagcagat     120
cagatgttcc cttcagaatc aaaacaaaag aaggttgaag aaaattcttg ggattctgag     180
agtctccgtg agactgtttc acagaaggat gtgtgtgtac ccaaggctac acatcaaaaa     240
gaaatggata aaataagtgg aaaattagaa gattcaacta gcctatcaaa aatcttggat     300
acagttcatt cttgtgaaag agcaagggaa cttcaaaaag atcactgtga acaacgtaca     360
ggaaaaatgg aacaaatgaa aaagaagttt tgtgtactga aaaagaaact gtcagaagca     420
aaagaaataa aatcacagtt agagaaccaa aaagttaaat gggaacaaga gctctgcagt     480
gtgaggtttc tcacactcat gaaaatgaaa attatctctt acatgaaaat tgcatgttga     540
aaaaggaaat tgccatgcta aaactggaaa tagccacact gaaacaccaa taccaggaaa     600
aggaaaataa atactttgag gacattaaga ttttaaaaga aaagaatgct gaacttcaga     660
tgaccctaaa actgaaagag gaatcattaa ctaaaagggc atctcaatat agtgggcagc     720
ttaaagttct gatagctgag aacacaatgc tcacttctaa attgaaggaa aaacaagaca     780
aagaaatact agaggcagaa attgaatcac accatcctag actggcttct gctgtacaag     840
accatgatca aattgtgaca tcaagaaaaa gtcaagaacc tgctttccac attgcaggag     900
atgcttgttt gcaaagaaaa atgaatgttg atgtgagtag tacgatatat aacaatgagg     960
tgctccatca accactttct gaagctcaaa ggaaatccaa aagcctaaaa attaatctca    1020
attatgccgg agatgctcta agagaaaata cattggtttc agaacatgca caaagagacc    1080
```

```
aacgtgaaac acagtgtcaa atgaaggaag ctgaacacat gtatcaaaac gaacaagata    1140
atgtgaacaa acacactgaa cagcaggagt ctctagatca gaaattattt caactacaaa    1200
gcaaaaatat gtggcttcaa cagcaattag ttcatgcaca taagaaagct gacaacaaaa    1260
gcaagataac aattgatatt cattttcttg agaggaaaat gcaacatcat ctcctaaaag    1320
agaaaaatga ggagatattt aattacaata accatttaaa aaaccgtata tatcaatatg    1380
aaaaagagaa agcagaaaca gaaaactcat gagagacaag cagtaagaaa cttcttttgg    1440
agaaacaaca gaccagatct ttactcacaa ctcatgctag gaggccagtc ctagcattac    1500
cttatgttga aaatcttacc aatagtctgt gtcaacagaa tacttatttt agaagaaaaa    1560
ttcatgattt cttcctgaag cctgggcgac agagcgagac tctgtctcaa aaaaaaaaaa    1620
aaaaaaagaa agaaagaaat gcctgtgctt acttcgcttc ccagg                    1665
```

<210> 16
<211> 179
<212> PRT
<213> Homo sapien

<400> 16

```
Ala Asn Phe Gln Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro
 1               5                  10                  15
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
            20                  25                  30
Asn Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys
        35                  40                  45
Gln Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu
    50                  55                  60
Thr Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys
65                  70                  75                  80
Glu Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser
                85                  90                  95
Lys Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln
            100                 105                 110
Lys Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys
        115                 120                 125
Lys Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys
    130                 135                 140
Ser Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser
145                 150                 155                 160
Val Arg Phe Leu Thr Leu Met Lys Met Lys Ile Ile Ser Tyr Met Lys
                165                 170                 175
Ile Ala Cys
```

<210> 17
<211> 1681
<212> DNA
<213> Homo sapien

<400> 17

```
gatacagtca ttcttgtgaa agagcaaggg aacttcaaaa agatcactgt gaacaacgta      60
caggaaaaat ggaacaaatg aaaaagaagt tttgtgtact gaaaaagaaa ctgtcagaag     120
caaaagaaat aaaatcacag ttagagaacc aaaaagttaa atgggaacaa gagctctgca     180
gtgtgagatt gactttaaac caagaagaag agaagagaag aaatgccgat atattaaatg     240
aaaaaattag ggaagaatta ggaagaatcg aagagcagca taggaaagag ttagaagtga     300
aacaacaact tgaacaggct ctcagaatac aagatataga attgaagagt gtagaaagta     360
```

```
atttgaatca ggtttctcac actcatgaaa atgaaaatta tctcttacat gaaaattgca     420
tgttgaaaaa ggaaattgcc atgctaaaac tggaaatagc cacactgaaa caccaatacc     480
aggaaaagga aaataaatac tttgaggaca ttaagatttt aaaagaaaag aatgctgaac     540
ttcagatgac cctaaaactg aaagaggaat cattaactaa aagggcatct caatatagtg     600
ggcagcttaa agttctgata gctgagaaca caatgctcac ttctaaattg aaggaaaaac     660
aagacaaaga aatactagag gcagaaattg aatcacacca tcctagactg gcttctgctg     720
tacaagacca tgatcaaatt gtgacatcaa gaaaaagtca agaacctgct ttccacattg     780
caggagatgc ttgtttgcaa agaaaaatga atgttgatgt gagtagtacg atatataaca     840
atgaggtgct ccatcaacca ctttctgaag ctcaaaggaa atccaaaagc ctaaaaatta     900
atctcaatta tgccggagat gctctaagag aaaatacatt ggtttcagaa catgcacaaa     960
gagaccaacg tgaaacacag tgtcaaatga aggaagctga acacatgtat caaaacgaac    1020
aagataatgt gaacaaacac actgaacagc aggagtctct agatcagaaa ttatttcaac    1080
tacaaagcaa aaatatgtgg cttcaacagc aattagttca tgcacataag aaagctgaca    1140
acaaaagcaa gataacaatt gatattcatt ttcttgagag gaaaatgcaa catcatctcc    1200
taaaagagaa aaatgaggag atatttaatt acaataacca tttaaaaaac cgtatatatc    1260
aatatgaaaa agagaaagca gaaacagaaa actcatgaga gacaagcagt aagaaacttc    1320
ttttggagaa acaacagacc agatctttac tcacaactca tgctaggagg ccagtcctag    1380
cattacctta tgttgaaaaa tcttaccaat agtctgtgtc aacagaatac ttattttaga    1440
agaaaaattc atgatttctt cctgaagcct acagacataa aataacagtg tgaagaatta    1500
cttgttcacg aattgcataa aagctgccca ggatttccat ctaccctgga tgatgccgga    1560
gacatcattc aatccaacca gaatctcgct ctgtcactca ggctggagtg cagtgggcgc    1620
aatctcggct cactgcaact ctgcctccca ggttcacgcc attctctggc acagcctccc    1680
g                                                                    1681
```

<210> 18
<211> 432
<212> PRT
<213> Homo sapien

<400> 18

```
Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys Asp His
 1               5                  10                  15
Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys Phe Cys
            20                  25                  30
Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu
        35                  40                  45
Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu
    50                  55                  60
Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn
65                  70                  75                  80
Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys
                85                  90                  95
Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp
            100                 105                 110
Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr
        115                 120                 125
His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys
    130                 135                 140
Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr
145                 150                 155                 160
Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu
                165                 170                 175
Lys Asn Ala Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu
            180                 185                 190
```

```
Thr Lys Arg Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala
        195                 200                 205
Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu
    210                 215                 220
Ile Leu Glu Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala
225                 230                 235                 240
Val Gln Asp His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro
                245                 250                 255
Ala Phe His Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val
            260                 265                 270
Asp Val Ser Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu
        275                 280                 285
Ser Glu Ala Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr
    290                 295                 300
Ala Gly Asp Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln
305                 310                 315                 320
Arg Asp Gln Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met
                325                 330                 335
Tyr Gln Asn Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu
            340                 345                 350
Ser Leu Asp Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu
        355                 360                 365
Gln Gln Gln Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys
    370                 375                 380
Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu
385                 390                 395                 400
Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys
                405                 410                 415
Asn Arg Ile Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Asn Ser
            420                 425                 430
```

<210> 19
<211> 3681
<212> DNA
<213> Homo sapiens

<400> 19

```
tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
cacccgtggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
gaacacctga cacggctgaa agcttggtgg aaaaaacacc tgatgaggct gcatccttgg 360
tggagggaac atctgacaaa attcaatgtt tggagaaagc gacatctgga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctagggaaat tatgagtccc gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgcgtgg 660
caagagtaac atctaataaa actaaagttt tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagaggttc ccatcagaat 780
ccaaacaaga ggaagatgaa gaatattctt gtgattctcg gagtctcttt gagagttctg 840
caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataaatagag 900
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
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<212> DNA
<213> Homo sapiens

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<211> 674
<212> DNA
<213> Homo sapiens

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gatcaaagaa ggaacatctg caggaacacc tgatgaggct gcacccttgg cggaaagaac 240
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acagtcagca gaagaaacac ctagggaaat tacgagtcct gcaaaagaaa catctgagaa 480
atttacgtgg ccagcaaaag gaagacctag gaagatcgca tgggagaaaa aagatgactc 540
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<210> 22
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<213> Homo sapiens

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<222> (11)
<223> n=A,T,C or G
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<210> 23
<211> 1337
<212> DNA
<213> Homo sapiens

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<210> 24
<211> 2307
<212> DNA
<213> Homo sapiens

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tacacatcaa aaagaaatag ataaaataaa tggaaaatta gaagggtctc ctgttaaaga 180
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gatggacatg caaactttca aagcagagcc tcccgagaag ccatctgcct tcgagcctgc 300
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<210> 25
<211> 650
<212> PRT
<213> Homo sapiens

<220>
<221> unsure
<222> (310)
<223> Xaa = Any Amino Acid
<221> unsure
<222> (429)
<223> Xaa = Any Amino Acid
<221> unsure
<222> (522)
<223> Xaa = Any Amino Acid

<400> 25

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             20                  25                  30

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
         35                  40                  45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
     50                  55                  60

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65                  70                  75                  80

Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
                 85                  90                  95

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
            100                 105                 110

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
        115                 120                 125

Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
    130                 135                 140

Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
145                 150                 155                 160

Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
                165                 170                 175

Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
            180                 185                 190

Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn
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195 200 205

Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro
210 215 220

Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro
225 230 235 240

Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser
245 250 255

Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala
260 265 270

Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser
275 280 285

Ser Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val
290 295 300

Cys Leu Pro Lys Ala Xaa His Gln Lys Glu Ile Asp Lys Ile Asn Gly
305 310 315 320

Lys Leu Glu Gly Ser Pro Val Lys Asp Gly Leu Leu Lys Ala Asn Cys
325 330 335

Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met
340 345 350

Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro
355 360 365

Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
370 375 380

Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys
385 390 395 400

Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu
405 410 415

Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Xaa His Gln Lys
420 425 430

Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asp Asn Asp
435 440 445

Gly Phe Leu Lys Ala Pro Cys Arg Met Lys Val Ser Ile Pro Thr Lys
450 455 460

Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro Glu
465 470 475 480

Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val Pro

485 490 495

Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Gln
500 505 510

Met Phe Pro Ser Glu Ser Lys Gln Lys Xaa Val Glu Glu Asn Ser Trp
515 520 525

Asp Ser Glu Ser Leu Arg Glu Thr Val Ser Gln Lys Asp Val Cys Val
530 535 540

Pro Lys Ala Thr His Gln Lys Glu Met Asp Lys Ile Ser Gly Lys Leu
545 550 555 560

Glu Asp Ser Thr Ser Leu Ser Lys Ile Leu Asp Thr Val His Ser Cys
565 570 575

Glu Arg Ala Arg Glu Leu Gln Lys Asp His Cys Glu Gln Arg Thr Gly
580 585 590

Lys Met Glu Gln Met Lys Lys Lys Phe Cys Val Leu Lys Lys Lys Leu
595 600 605

Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu Glu Asn Gln Lys Val Lys
610 615 620

Trp Glu Gln Glu Leu Cys Ser Val Arg Phe Leu Thr Leu Met Lys Met
625 630 635 640

Lys Ile Ile Ser Tyr Met Lys Ile Ala Cys
645 650

<210> 26
<211> 228
<212> PRT
<213> Homo sapiens

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Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
20 25 30

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
35 40 45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
50 55 60

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
65 70 75 80

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Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
                85                  90                  95

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
            100                 105                 110

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
        115                 120                 125

Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
    130                 135                 140

Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
145                 150                 155                 160

Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
                165                 170                 175

Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
            180                 185                 190

Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg
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Phe Leu Phe Lys Asn Gln Leu Thr Glu Tyr Phe Ser Lys Leu Met Arg
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Arg Asp Ile Leu
225
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<210> 27
<211> 154
<212> PRT
<213> Homo sapiens

<220>
<221> unsure
<222> (148)
<223> Xaa = Any Amino Acid

<400> 27

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Trp Trp Lys Lys His Leu Met Arg Leu His Pro Trp Trp Lys Glu His
            20                  25                  30

Leu Thr Arg Leu Lys Ala Trp Trp Lys Lys His Leu Met Arg Leu His
        35                  40                  45

Pro Trp Trp Arg Glu His Leu Thr Lys Phe Asn Val Trp Arg Lys Arg
    50                  55                  60
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His Leu Glu Ser Ser Asn Ser Gln Gln Lys Lys His Leu Gly Lys Leu
 65                  70                  75                  80

Arg Val Leu Gln Lys Lys His Leu Arg Asn Leu Arg Gly Gln Gln Lys
                 85                  90                  95

Glu Asp Leu Gly Arg Ser His Gly Arg Lys Lys Met Thr Gln Leu Arg
            100                 105                 110

Gln Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
        115                 120                 125

Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
    130                 135                 140

Lys Lys Lys Xaa Lys Lys Lys Lys Lys
145                 150
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<211> 466
<212> PRT
<213> Homo sapiens

<220>
<221> unsure
<222> (329)
<223> Xaa = Any Amino Acid

<400> 28

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Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
            20                  25                  30

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
        35                  40                  45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
    50                  55                  60

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
65                  70                  75                  80

Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
                 85                  90                  95

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
            100                 105                 110

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
        115                 120                 125
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Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
    130                 135                 140

Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
145                 150                 155                 160

Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
                165                 170                 175

Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
            180                 185                 190

Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn
        195                 200                 205

Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro
    210                 215                 220

Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro
225                 230                 235                 240

Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser
                245                 250                 255

Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala
            260                 265                 270

Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn
        275                 280                 285

Ser Trp Asp Thr Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val
    290                 295                 300

Cys Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly
305                 310                 315                 320

Lys Leu Glu Gly Ser Pro Gly Lys Xaa Gly Leu Leu Lys Ala Asn Cys
                325                 330                 335

Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met
            340                 345                 350

Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro
        355                 360                 365

Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
    370                 375                 380

Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys
385                 390                 395                 400

Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu
                405                 410                 415
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Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Ala His Gln Lys
420 425 430

Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg Phe Leu
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Phe Lys Asn His Leu Thr Lys Tyr Phe Ser Lys Leu Met Arg Lys Asp
450 455 460

Ile Leu
465

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<211> 445
<212> PRT
<213> Homo sapiens

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20 25 30

Lys Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro
35 40 45

Glu Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val
50 55 60

Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp
65 70 75 80

Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser Ser
85 90 95

Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys
100 105 110

Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys
115 120 125

Leu Glu Glu Ser Pro Asp Asn Asp Gly Phe Leu Lys Ala Pro Cys Arg
130 135 140

Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met Gln
145 150 155 160

Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro Ala
165 170 175

Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn
180 185 190

Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys Gln
195 200 205

Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu Thr
210 215 220

Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys Glu
225 230 235 240

Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser Lys
245 250 255

Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys
260 265 270

Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys
275 280 285

Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser
290 295 300

Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val
305 310 315 320

Arg Leu Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile
325 330 335

Leu Asn Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His
340 345 350

Arg Lys Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile
355 360 365

Gln Asp Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser
370 375 380

His Thr His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu
385 390 395 400

Lys Lys Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His
405 410 415

Gln Tyr Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu
420 425 430

Lys Glu Lys Asn Ala Glu Leu Gln Met Thr Pro Arg Ala
435 440 445

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<211> 578
<212> DNA
<213> Human

<400> 30
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agaatccgac aacagctgct ccagctgaca cgtatccagc tactggtcct gctgatgatg 180
aagcccctga tgctgaaacc actgctgctg caaccactgc gaccactgct gctcctacca 240
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tatccccttt atctctaatc agtttatttt ctttcaaata aaaaataact atgagcaaca 480
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<211> 90
<212> PRT
<213> Homo sapien

<400> 31
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20 25 30
Ala Thr Gly Pro Ala Asp Asp Glu Ala Pro Asp Ala Glu Thr Thr Ala
35 40 45
Ala Ala Thr Thr Ala Thr Thr Ala Ala Pro Thr Thr Ala Thr Thr Ala
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Ala Ser Thr Thr Ala Arg Lys Asp Ile Pro Val Leu Pro Lys Trp Val
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Gly Asp Leu Pro Asn Gly Arg Val Cys Pro
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<211> 3101
<212> DNA
<213> Homo sapien

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cgtgatctgc cagccttggc ctcccaaagt gtattctctt tttattatta ttattatttt 180
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gactataata attgtgctca ctaatttctg ttcactaata ttatcagctt agataatact 660
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tcaccttata gatcaagtgt attccctaaa tattttattt ttgtagctat tgtagatgaa    2940
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ttttatttgt tggtttttaa tcaaaaactg tattaaactt agagtttttt gtggagtttt    3060
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<400> 33
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<210> 34
<211> 23
<212> DNA
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<220>
<223> PCR primer

<400> 34
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<210> 35
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 35
ttgcagccaa gttaggagtg aagagatgca 30

<210> 36
<211> 24
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<220>
<223> PCR primer

<400> 36
aagcctcaga gtccttccag tatg 24

<210> 37
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<212> DNA
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<220>
<223> PCR primer

<400> 37
ttcaaatata agtgaagaaa aaattagtag atcaa 35

<210> 38
<211> 37
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<220>
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caaccacgtg acaaacactg gaattacagg 30

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tgtcatatat taattgcata aacacctca 29

<210> 50
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<400> 60
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<210> 61
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<400> 61
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<210> 62
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<210> 64
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<210> 67
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<400> 67
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<210> 68
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<400> 68
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<400> 70
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<400> 71
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<210> 72
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<220>
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<400> 72
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<210> 73
<211> 503
<212> DNA
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<400> 73

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<210> 74
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<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens

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        35                  40                  45
Phe Asp Ala Pro Pro Glu Ala Val Ala Ala Lys Leu Gly Val Lys Arg
    50                  55                  60
Cys Thr Asp Gln Met Ser Leu Gln Lys Arg Ser Leu Ile Ala Glu Val
65                  70                  75                  80
Leu Val Lys Ile Leu Lys Lys Cys Ser Val
                85                  90
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